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TWO NEW SPECIES OF FROGS, FIVE NEW SPECIES AND A NEW RACE OF LIZARDS FROM THE DOMINICAN REPUBLIC

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From October 1929 to January 1930 the junior writer made collections of reptiles and amphibians in Hispaniola on a grant from the Angelo Heilprin Exploring Fund of the American Museum. In 1932, he had the opportunity of continuing this work in a little-known part of the same island through the kindness of Mr. Lorenzo D. Armstrong. Although the object of both expeditions was to secure life-history material, a surprisingly large number of new species was secured. The present paper embraces a description of these new species. An account of the life histories worked out will appear in later publications.

Four of the new species of frogs and lizards were found in the Sierra de Bahoruco, a range of mountains lying in the southwestern part of the Dominican Republic and extending into Haiti. These mountains, unlike most of the surrounding lowlands, receive a plentiful rainfall. Coffee is grown in many sections and a typical rain forest extends over some of the areas which have not been cleared. Collecting was carried on in this range near Polo and Maniel Viejo in the interior and near Barahona and Paradis on the coast.

Early in October 1932, a trip was made to Alta Vela, a small island twenty miles off the extreme southern tip of Santo Domingo and approximately ten miles southwest of Beata Island. No herpetological collections have previously come from this islet so far as we are aware. Although it is only three-quarters of a mile long and half a mile wide, four species of lizards and one snake were found to occur here. Three of these five species were found to be new and both of the others differ in some detail from material from the adjoining mainland. More material is required from the nearby coasts of Santo Domingo and Haiti before the degree of divergence of these two incipient races can be fully stated.

One of these doubtful forms we refer provisionally to *Aristelligella expectatus* (Cochran), although the nine specimens collected on Alta Vela were all slightly redder than our series of forty-three specimens collected

from the Barahona region. The only snake found on Alta Vela we refer to *Typhlops lumbricalis* (Linnaeus). The one specimen secured has 385 scales in a row from head to tail. Our two specimens from Duvergé, D. R., have 297 and 300 scales respectively in the same distance. Our one specimen from the mountains near Barahona has only 289 scales in the same row. However, the head scalation in all these specimens is typical of *T. lumbricalis*, and all have 20 scale rows around the body.

It is highly probable that the *Typhlops*, the *Aristelligella*, and the three species described below represent the entire herpetological fauna of Alta Vela. This island, unlike Beata, to the northeast, rises steeply in the center and is crowned by a double ridge, the higher crest being approximately 500 feet above sea-level. The island is rough, with much exposed rock. The sparse vegetation consists of grass and cacti except along the northern coast and in a few sections of the northern slope of the ridge where some low trees are found. Approximately forty goats and one or two dogs are living in a feral state on the island. The dogs are probably a constant menace to the lizards. No evidence was found of large numbers of sea birds using the island as a rookery and hence the lizards, together with the invertebrates of the shore and young goats, may form the principal food supply for the dogs. One dog was shot while attempting to steal food from the expedition's larder.

Eleutherodactylus armstrongi, new species

DIAGNOSTIC CHARACTERS.—Closely allied to *E. wetmorei* Cochran and to *E. auriculatoides* Noble but differing from either in the narrower head, more extensive series of vomerine teeth, and distinctive coloration. The vomerine series extend lateral to the choanae. The dorsal surfaces are more or less spotted but the posterior surfaces of the thighs, unlike those of *E. wetmorei*, are uncolored or uniformly toned. Further, the spots are small and do not run together to form blotches except bordering the pale dorsolateral and interorbital stripes.

DETAILED DESCRIPTION.—Type: A. M. N. H. No. 44554, adult female. Collected at "El Propio Esfuerzo," coffee finca of Luis E. Del Monte, near Barahona, D. R., at an altitude of 1800 feet, on August 3, 1932, by W. G. Hassler.

Head a trifle longer than broad, not so broad as body; distance between anterior corner of eye and nostril a little less than the greatest diameter of the eye, equal to the interorbital width; distance between nostril and tip of snout contained two times in the distance between nostril and eye; canthus rostralis rounded; tympanum well defined, its greatest diameter a little greater than half the diameter of the eye, separated from the eye by a space a trifle less than its diameter. Tibiotarsal joints of either side slightly overlap when the legs are placed at right angles to the body; tibiotarsal articulation reaches the posterior corner of the eye. Discs of the three

[1]Named in honor of Mr. John C. Armstrong who planned the second expedition and assisted in much of the herepetological collecting.

outer fingers well developed, truncate, that of the outer finger as broad as the diameter of the tympanum; discs of the toes and of the inner finger smaller and rounded. Digits free; no tarsal fold, but a very poorly defined ridge present in the position of a tarsal fold. Vomerine teeth caudal to the choanae, in two arched series which begin lateral to the outer margin of the choanae and extend nearly to the midline. Tongue thick, not emarginate behind. Skin very finely granular or irregularly ridged above, belly smooth in the center, slightly granular on the sides, ventral surfaces of the thighs coarsely granular.

Ground tone (in alcohol) a pale gray or brownish; a pair of dorsolateral stripes and a narrow interorbital band a slightly paler tone. Entire dorsal surface of the head and body except for these stripes and the canthal region of each side spotted with dark brown, the spots tending to run together along either margin of the stripes. Dorsal surface of the appendages more finely spotted with the same color; posterior surfaces of the thighs suffused with brown but not spotted. Ventral surfaces of head and body stippled with grayish brown, the tone nearly uniform on the throat and chest but tending to become blotched on the abdomen, the center of which remains uncolored. Ventral surfaces of the limbs stippled or washed with the same color.

DIMENSIONS.—Tip of snout to vent, 35 mm.; width of head, 12 mm.; tip of snout to posterior border of tympanum, 12.5 mm.; fore leg from axilla, 23 mm.; hind leg from vent, 51 mm.; vent to heel, 28 mm.

VARIATION.—The 37 paratypes in the series (A. M. N. H. Nos. 44550, 44558–64, 44598, 44607–8, 44633–41, 44652–65, 44667–9) vary considerably in the degree of spotting. In some specimens (in alcohol) the ground tone on the back between the pale dorsolateral stripes is a chestnut brown nearly as dark as the spotting, which may be much reduced. The spots vary in size and in several specimens fail to form a dark margin to the pale stripes. In other specimens the dorsolateral stripes may extend from the head only to the middle of the back or be absent entirely.

In life the type, when caught at night, was a light yellowish-brown, spotted with darker brown. Next day the dorsal ground tone was a rich golden-brown spotted with very dark brown. The dorsolateral stripes, a region directly over the eyes and extending on either side to the snout, and an irregular bar between the anterior corners of the eyes were clear and translucent. The legs, lateral and posterior portions of the body were light golden-brown with smaller dark spots. The throat was darker than the belly, and brownish. The eyes were yellowish green-gold suffused with brown in the posterior part. The other specimens varied in color, some having a dorsal ground tone of reddish brown with the light areas on the head, the dorsolateral stripes and the arms and legs of a distinct reddish hue; the sides and belly yellowish. Others had a ground color of grayish brown, the dorsolateral stripe and light areas on the head a golden brown; the sides, legs, and throat a grayish brown and the belly white.

HABITAT.—This species appears to be common throughout the region studied, becoming more abundant as the altitude, and hence humidity, increases. A few specimens were taken at 1800 feet and more between 3000 and 3200 feet near Barahona. Other specimens were taken at 2400 feet near Paradis, 3700 feet near Polo, and 3000 feet at Maniel Viejo. They were usually found in the ends of hollow stems and other cavities such as the base of banana leaves and certain mountain palms though occasionally they were discovered among damp leaves and stones on the ground.

Eleutherodactylus rufifemoralis, new species

DIAGNOSTIC CHARACTERS.—A very small species, closely allied to *E. minutus* Noble from which it differs in its finely tubercular skin, its dark dorsal and ventral surfaces, and its distinctive thigh coloration. In life the concealed portions of the flexed thighs were red, while in alcohol these are yellow or pink.

DETAILED DESCRIPTION.—Type: A. M. N. H. No. 44556, male. Collected in a ravine above "Salvation Station" on property of Luis E. Del Monte, near Barahona, D. R., at an altitude of 3000 feet, August 4,1932, by W. G. Hassler.

Head as long as broad, a little broader than body; distance between anterior corner of the eye and nostril about four-fifths the greatest diameter of the eye, a trifle less than the interorbital width; distance between the nostril and tip of snout contained one and one-half times in distance between nostril and eye; canthus rostralis rounded, the loreal region flat; tympanum distinct, its diameter contained twice in the greatest diameter of the eye, separated from the eye by a space equal to two-thirds of its diameter. Tibiotarsal joints of either side make contact without overlapping when the legs are placed at right angles to the body, tibiotarsal joint extended forward reaches nearly to the anterior border of the eye. Digital dilations very small, the largest of the finger dilations equal to a third the diameter of the tympanum. Digits free; second toe a little longer than the first, no tarsal fold. Vomerine teeth in two oblique groups well behind the choanae and extending outward to about the middle of each opening. Tongue ovoid, not emarginate but extensively free behind. Skin finely tubercular above except for those portions of the skin which are concealed when the appendages are flexed. Ventral surfaces of the thighs, tibial and tarsal surfaces granular; sides of the body granular, but the belly and throat smooth.

Dorsal surfaces of head and body (in alcohol) a dark chestnut-brown; an interorbital bar and some indication of a broad dorsolateral stripe slightly paler than the ground tone. An irregular bar of dark brown extending backward and ventrally on each side of the body from the ear to the groin; dorsally to this on each side a wedge-shaped bar of dark brown bordering the ilium; several spots of dark brown on the sides of the body and bars of the same color across the legs. Concealed portions of the thighs yellowish or slightly pink; posterior surfaces of the thighs below this area brown heavily spotted with dark brown. Ventral surface brown spotted with white, larger spots of white or gray on both upper and lower jaws.

DIMENSIONS.—Tip of snout to vent, 17.5 mm.; width of head, 6.5 mm.; tip of snout to posterior border of tympanum, 6.3; greatest diameter of eye, 1.5 mm.;

diameter of tympanum, 1.1 mm.; fore leg from axilla, 11. 5 mm.; hind leg from vent, 28 mm.; vent to heel, 15.5 mm.

VARIATION.—The seven paratypes in the series (A. M. N. H. Nos. 44557, 44596, 44628–31, 44651) vary both in color and in rugosity. In six (in alcohol) there is a distinct dorsolateral stripe of a pale tone and in several there is a series of dark-brown spots on the throat. The double stripe on the side of the body may be broken into spots, but there is always some indication of the upper stripe which borders the ilium. Three of the specimens appear to be nearly smooth above, but these are not so well preserved as the others.

In life, the dorsal ground color was very dark brown, mottled with nearly black. The dorsolateral lines frequently formed crescents of dark golden-brown and were bordered above with black. The bar between the eyes was nearly black as were those on the legs. The concealed portions of the thighs were suffused with a rich reddish-brown. The ventral surfaces were brown spotted with white.

HABITAT.—These tiny frogs are apparently widely spread throughout the mountains, though they are not abundant. Besides the type locality, they were found at 2400 feet near Paradis and at 3700 feet near Polo. As a rule they were among damp leaves and stones on the ground, but one was found at the base of a banana leaf.

Sphaerodactylus armstrongi, new species[1]

DIAGNOSTIC CHARACTERS.—A small species, adult males approximately 50 mm. in total length; scales on upper surface of snout and head strongly keeled, two to three times as large as those on the occiput; scales on the upper surface of the body imbricate and keeled, those on the throat, chest, and sides of the body also keeled, while those on the center of the abdomen are smooth. Adult male very dark brown in color with a wide open V on the occiput, two spots on the scapular region, two spots on the base of the tail of a lighter tone. The light spots more or less surrounded with smaller spots of dark brown; some very feeble blotches of dark brown poorly indicated on the upper surface of the head. A dark streak along the side of the head and through the eye; sides of the head lighter than the occiput; a dark streak on the side of the head directly before and behind the eye.

DETAILED DESCRIPTION.—Type: A. M. N. H. No. 51470, adult male. Collected on mountain top on property of G. Herrmann near Paradis, Barahona Province, D. R., 2400 feet, August 25, 1932, by W. G. Hassler.

Snout a trifle less than twice as long as the greatest diameter of the eye; distance from tip of snout to center of eye approximately equal to distance from center of eye to posterior margin of the ear opening; rostral plate rounded with a very feeble lateral ridge or canthus, rostral with a single median cleft behind; nostril surrounded by the rostral, first supralabial, enlarged supranasal, and two other scales of which the

[1]Named for Mr. Lorenzo D. Armstrong, whose generosity made the 1932 expedition possible.

more ventral is only one-sixth to one-seventh as large as the dorsal; a single scale separating the supranasals in the midline a trifle larger than the scales covering the forehead; three enlarged supralabials; the most posterior extending well behind the center of the eye; scales on the upper surface of the head posterior to the supranasals keeled, diminishing gradually in size posteriorly, those immediately behind the supranasals only a third to a fourth larger than those between the eyes, but two to three times as large as those on the occiput; six scales in a line between the supranasals and a groove forming the anterior border of the orbit, three or four scales in the anterior part of this row two to three times as large as the small scales immediately behind; nineteen scales in a row across the snout from supralabial to supralabial immediately in front of the anterior border of the orbits; scales covering the upper surface of the body strongly keeled and imbricate; ten scales on the side of the body between the front and hind legs contained in the distance between the tip of snout and center of eye. Longitudinal axis of mental a third longer than same axis of rostral; three enlarged infralabials, the first a little less than twice as long as the second, the second a little less than twice as long as the third. Scales on the ventral surface of the throat, chest, and sides of abdomen keeled; those on the middle of the abdomen smooth, scales gradually decreasing in size from the infralabials toward the throat, rapidly increasing in size immediately behind the throat; the scales on the chest and abdomen two to three times as large as the scales on the throat. A broad band of keeled imbricate scales on the outer surface of the fore limbs, these scales nearly as large as those on the chest; the other scales on the fore limbs small and tubercular; scales on the outer surface of the upper segment of the hind limb similar to the dorsals but smaller, merging gradually into those of the posterior surface of the leg which are much smaller and tubercular; scales on the ventral side of the hind limbs (except for the hypertrophied preanal scales) keeled like those on the sides of the abdomen, but diminishing in size distally. Scales on the dorsal surface of the tail similar to the dorsal body scales but about one-third larger on the anterior part of the tail; ventral scales smooth, varying considerably in size, the average scale measuring about one-third larger than those of the abdomen.

Uniform dark brown above (in alcohol), slightly paler on the snout and sides of the head; a dark streak from the rostral plate through the eye and fading out on the temporal region; a pale, widely opened V on the nape of the neck; two light spots on the scapular region margined with a few spots of dark brown; a few feeble spots of the same tone on the occiput and upper surface of the neck; a pale streak on the lower half of the side of the tail margined above by a streak of dark brown; a few irregular and indistinct spots of dark brown along the ventral margin of the same streak; throat and under surface of neck spotted with brown; ventral surface of limbs and abdomen suffused with the same tone.

DIMENSIONS.—Head and body, 27 mm.; tail, 23 mm.; snout to posterior edge of ear, 6.5 mm.; snout to center of eye, 3.5 mm.; width of head, 5 mm.; fore limb from axilla, 7 mm.; hind limb from groin, 8 mm.

VARIATION.—The only paratype in the series is another adult male (A. M. N. H. No. 51469) which is identical to the type, except that a pair of light spots is visible on the dorsal surface of the tail base. These spots like those of the scapular region are more or less margined with a few dark brown blotches. The general ground tone of the upper surface

is slightly lighter than the type, and the few small spots of dark brown scattered over the upper surface of the head and body are better indicated. In life this species was characterized by its dark tone. The color did not change greatly on preservation.

HABITAT.—These two specimens were both found under stones about twelve feet apart, in the deep channel cut by a small stream. There was no standing water, but the stream bed and steep sides were very damp. The mountain top in the vicinity was covered with rain forest.

Sphaerodactylus altavelensis, new species

DIAGNOSTIC CHARACTERS.—A small species, approximately 50 mm. in total length, very closely related to *S. difficilis* Barbour but differing in a combination of characters. Posterior part of throat covered with a broad band of keeled scales. Ten scales on the side of the body in a distance between that of the tip of snout and center of eye. One or two dark streaks on the posterior side of the thigh extending along the sides of the tail. Adult male and female gray and spotted above with dark brown. A "mask" formed by a dark blotch and a pair of white spots well defined on the shoulders of the immature and feebly developed in the adult female. Streaks on the sides of the head and occiput region of the immature and of most females.

DETAILED DESCRIPTION.—Type: A. M. N. H. No. 51488, adult male. Collected on Alta Vela Island, D. R., October 9–10, 1932, by W. G. Hassler.

Snout a trifle less than twice as long as greatest diameter of the eye; distance from tip of snout to center of eye greater than distance from center of eye to ear opening; rostral plate rounded but with a distinct lateral ridge or canthus; rostral with a single median cleft behind; nostril surrounded by the rostral, first supralabial, supranasal, and two other scales of which the more ventral is only about one-tenth as large as the more dorsal. A single scale separating the supranasals in the midline a trifle larger than the scales immediately posterior to it; three enlarged supralabials followed by three much smaller suboculars; the posterior supralabial not reaching the center of the eye. A cluster of three or four scales on the superciliary margin directly over the dorsal anterior border of the eye distinctly larger than the superciliary scales posterior to them, one of the scales in the group forming an outwardly directed spine; scales on the upper surface of the head posterior to the supranasals keeled, except for two or three scales on the most anterior row; scales between the anterior half of the orbits slightly longer than those on the snout, but only a half or two-thirds as broad; scales on the upper surface of the head behind the orbits diminishing rapidly in size to form a series of very small scales on the greater part of the occiput. Six scales in a line between supranasals and a groove forming the anterior border of the orbit; seventeen scales in a row across the snout from supralabial to supralabial immediately in front of the anterior border of the orbits. Scales covering the upper surface of the body strongly keeled and imbricate; no enlarged scales in the midline; ten scales on the side of the body between the front and hind legs contained in the distance between the tip of snout and center of eye. Mental a little longer than broad, about twice as long as the rostral; three enlarged infralabials, the fist approximately twice as long as the second; the second twice as long as the third; the scales in a broad band across the throat and along the sides of the abdomen keeled; those in the middle of the abdomen

smooth; scales on the abdomen two or three times as large as those on the throat. A broad band of scales on the upper surface of the fore limbs covered with keeled imbricated scales on both upper and lower arm, the remaining scales small and tubercular; a similar band of enlarged scales on the entire length of the hind legs keeled and imbricated like the dorsals, but these scales greatly diminishing in size on the lower leg; scales on the posterior part of the thighs small and tubercular; scales on the ventral surface of the hind limb keeled like those on the sides of the abdomen and decreasing in size distally on the leg; a patch of hypertrophied preanal scales forming a triangular patch anterior to the cloaca. Dorsal scales on this regenerated tail keeled like the body-scales and on the anterior part of the tail a trifle smaller than these; scales on the ventral surface of the tail smooth; scales forming the ventral midline of the regenerated portion very broad.

Ground tone (in alcohol) a pale grayish-brown, slightly redder on the tail and head; a series of conspicuous dark brown spots on the entire upper surface; these spots on the upper surface of the head few and of about the same size as the pupil, increasing in number on the occiput, becoming numerous on the body where they average about one-half the size of those on the neck; the dark spots tend to arrange themselves in rows on the posterior body region and are transformed into a dark streak in the inguinal region; another streak of dark brown on the posterior surface of each thigh extending back along the side of the tail for only a short distance (due to the regenerated tail.) Ventral surfaces grayish or straw-color spotted with dark brown on the throat and sides of the body, irregularly streaked with the same tone on the chest and abdomen.

DIMENSIONS.—Head and body, 26.5 mm.; tail (regenerated), 26 mm.; snout to posterior edge of ear, 6.5 mm.; snout to center of eye, 3.5 mm.; width of head, 5 mm.; fore limb from axilla, 7 mm.; hind limb from groin, 9.5 mm.

VARIATION.—An adult female is usually more streaked than a male, and exhibits a "mask" in the scapular region. This mask is formed by a large blotch of dark brown surrounding a pair of white spots. Some adult females are nearly identical in color pattern to adult males but the spots are smaller and tend to streak more. The spotting on the head tends to streak, and in the immature of both sexes as well as in adult females these streaks form a conspicuous crescent on the occiput and have a narrow median stripe extending forward between the eyes. There are also two other dark streaks more or less well defined extending backward from the orbit. Two or three streaks are found anterior to each thigh and two conspicuous ones along the posterior aspect of the thigh and along the tail. The spotting of the ventral surface varies considerably, but in the females there is usually more streaking than in the males.

The dorsal color of these lizards varied in life from light to dark brown. The lighter ones had a decidedly orange tinge on the head and tail. The belly was usually a light yellowish-brown or grayish color.

HABITAT.—Specimens of this species were first found under loose rough chunks of limestone on the rocky headland, thirty to fifty

feet above sea-level at the southeast end of Alta Vela. They were later found under rocks and in crevices in outcropping limestone in the low field at the northern end of the island. Still others were taken from under loose rocks high on the ridges in the center of the island.

REMARKS.—We have compared our series of twenty paratypes (A. M. N. H. Nos. 51472–87, 51489–92) with *Sphaerodactylus* from various parts of the adjacent mainland and have found no specimens which exhibit the combination of characters seen in the Alta Vela series. No doubt several species have been confused under the name *difficilis*, but until the variation of this species has been determined the exact relationships of *altavelensis* cannot be fully seated.

Anolis dominicensis altavelensis, new subspecies

DIAGNOSTIC CHARACTERS.—Closely allied to *Anolis dominicensis* Reinhardt and Lütkin of the mainland of Hispaniola, but differing from it conspicuously in its bright reddish-brown color in life; preserved specimens being a pale tan or brownish gray. The scalation of the tail is also distinctive, the scales on the upper surface of the side being larger than in *dominicensis* and gradually increasing in size from the anterior to the posterior margin of each segment. The crest of the tail is lobulated, due to the fact that the third and fourth scales in each segment are larger than the other scales forming the crest of that segment.

DETAILED DESCRIPTION.—Type: A. M. N. H. No. 51050, adult male. Collected at Alta Vela Island, D. R., October 9–10, 1932, by W. G. Hassler.

Head slightly narrower than that of *A. dominicensis;* frontal ridges weakly developed, extending slightly anterior to the orbit; rostral small, one-third narrower than the mentals; four scale-rows between the scales that are pierced by the nostrils; six irregular pairs of roughly rectangular scales on the snout extending from the rostral to the supraorbital semicircles and forming a continuous series with them; these gradually increasing in size posteriorly and each pair making contact in the midline, except for the most posterior pair which are separated by a small scale; supraorbital semicircles on each side making a broad contact with one another in the interorbital region; the anterior pair of scales in the combined series separated for about one-half their length by a small scale which is approximately the size of the scale separating the most posterior pair of enlarged scales on the snout; occipital slightly longer than ear opening and twice as wide, roughly egg-shaped, in contact with the supraorbital semicircles on one side and separated by a single small scale on the other; supraocular disc composed of three large scales on the inner border and three to four smaller ones on the outer border, separated from the semicircles by one or two rows of very small scales. A cluster of three small scales forming the anterior margin of the superciliary, of these the posterior very much longer and narrower than the others; these scales continuous with the canthus rostralis which extends about halfway across the loreal region; the canthus rostralis formed of a single enlarged scale, but anterior to this are three scales belonging to the same series; scales of this series greatly diminishing in size anteriorly; loreal rows four. Scales of the subocular semicircle feebly keeled or slightly tubercular, three of the central scales of this series in broad

contact with the supralabials; supralabials eight or nine, but the last scale which lies behind the midpoint of the eye is smaller than the anterior supralabials. Temporal granules approximately the same size as the dorsals except for those in the midline of the back; temporals gradually increasing in size toward the occipital and toward the supratemporals which form a double row of large scales extending from above the ear to the border of the orbit. Back and sides covered with small, slightly tubercular granules; those of the midline of the back being slightly larger than the others. Ventral surface covered with large smooth imbricate scales; each scale ovoid and three to four times as large as the dorsal granules; throat covered with flat granules slightly larger than the scales on the abdomen; fore limbs covered with small smooth scales except for the anterior margin of the forearm which is covered with a row of scales slightly larger than the largest scales of the dewlap; anterior scales of femur and tibia smooth, similarly enlarged, gradually diminishing in size on the dorsal and ventral surface of the appendage; scales covering hands and feet above enlarged, perfectly smooth. Digital expansions moderate, about sixteen lamellae under second and third phalanges of fourth toe, about twenty-seven under the whole toe. Tail slightly compressed with barely defined verticils, the limits of each being marked by a feebly indicated vertical groove and by two or three vertical rows of slightly enlarged scales; five enlarged spines on the midline of the back in each segment of the tail, the third and fourth of the series being the largest. Very feeble indication of nuchal fold.

Uniform brownish gray above (in alcohol), lighter below; under surface of the appendages straw-colored; dewlap tinged with orange.

DIMENSIONS.—Head and body, 47 mm.; tail (regenerated), 50 mm.; snout to posterior edge of ear, 13 mm.; snout to center of eye, 8 mm.; width of head, 8.3 mm.; fore leg to base of toes, 14 mm.; hind leg to base of third and fourth toe, 24.5 mm.

VARIATION.—The thirteen paratypes of the series (A. M. N. H. Nos. 51037–49), agree with the type in color. They were all reddish brown in life and have faded to a pale fawn tone in alcohol. The head-scales exhibit considerable variance but no greater than has been observed in typical specimens of *dominicensis*. *Altavelensis* is an island form of *dominicensis* exhibiting a constant color difference and apparently constant differences in the scalation of the tail. The peculiar color of this lizard in life is difficult to describe. Specimens were matched in the field as nearly as possible with tints of Winsor and Newton's water-colors. These adapted to Ridgeway's nomenclature of colors would be as follows: The dorsal surface most often approached an ochraceous rufus but ranged to nearly a gallstone yellow. The ventral surfaces varied from gallstone yellow to deep chrome. The dewlap in the males was a dragon's blood red. There were no dark markings on the dorsal or ventral surfaces except occasionally in a very dark individual. In such an individual a faint pattern of fine dark veining was sometime visible all over the body.

HABITAT.—This species was fairly common throughout the small island of Alta Vela, where individuals were seen running on rocks, trees, and bushes from about sunrise until long into the dusk. During the hotter part of the day they remained in shady places. They were very wary and difficult to approach.

Anolis bahorucoensis, new species

DIAGNOSTIC CHARACTERS.—This species is not closely allied to any other *Anolis* in Hispaniola. It differs from other slender-bodied *Anolis* of the Island in being heavier and having a less well-defined band of enlarged scales in the mid-dorsal line of the back. It also differs from these in its smooth ventral scales and in the absence of a dewlap. The very marked sexual dichromatism of the species is another of its distinctive features.

DETAILED DESCRIPTION.—Type: A. M. N. H. No. 51128, adult male. Collected in the Valley of Polo, Barahona Province, D. R., September 14–19, 1932, by W. G. Hassler.

Habitus slender, body compressed, head elongate with sharp canthus rostralis; greatest diameter of the eyes contained three and one-third times in the distance from tip of snout to eye-slit; distance across the head immediately anterior to the orbits contained twice in the distance between the tip of snout and center of eye; frontal ridges very weak, diverging anterior to the eye and then slightly coverging to end immediately behind and medial to the nostril on either side; frontal region slightly concave between these ridges; scales on the upper surface of the head anterior to the orbits smooth, scales on the supraorbital semicircles and of the supraorbital discs keeled. Rostral low, about two and one-half times as wide as high; ventral margin of subnasal scale in contact with rostral, nostrils separated from the rostral by a prenasal scale which is larger than the nostril; prenasals separated from one another by a pair of internasals which are slightly larger than either prenasal; a pair of scales immediately behind the internasals, slightly larger than them and making broad contact with them behind and slight contact with one another in the midline; three or four large scales forming the posterior two-thirds of the frontal ridges, these scales two to three times as large as the other scales on the top of the snout which are irregularly polygonal; supraorbital semicircles separated from each other by a single scale at their midpoint and by a wedge of scales immediately before and behind this point; occipital scale about five-sixths as long and three-fourths as broad as the ear opening; occipital scale entirely surrounded by small scales and separated from the supraorbital semicircles by from four to six rows of these small scales; supraorbital discs composed of eight enlarged scales, six of these being much larger than the other two; supraorbital discs separated from the supraorbital semicircles for almost their entire length by a single row of small elongate scales; a single narrow keeled scale longer than the greatest length of the supraorbital disc forming the anterior superciliary margin of the orbit, this scale continuous with a row of seven strongly keeled overlapping scales which form the canthus rostralis of either side; a single enlarged scale mesial to the anterior part of the elongate superciliary scale, this scale separated by two or three rows of small scales from the supraorbital disc; supraorbital region posterior to the elongate superciliary scale and the supraocular disc covered with many small granular scales. Loreal region covered with regular

rows of ovoid scales, the rows increasing from two in front to seven immediately before the orbit; subocular semicircles formed of five or six enlarged keeled scales and a series of smaller ones, which form the posterior part of each semicircle; three of these enlarged scales in contact with the supralabials; supralabials seven or eight, the sixth and seventh and part of the fifth below the eye. Temporal granules about the same size as those on the sides of the body, distinctly smaller than those along the midline of the back; supratemporal line formed of two to three rows of scales only slightly larger than the adjacent temporals; these supratemporal scales about half or a third as large as the small scales forming the posterior section of the subocular semicircle. A band of from two to four enlarged keeled scales extending the length of the back in the midline; scales on the sides of the body only one-half to one-third as large as the mid-dorsal scales, but gradually increasing in size toward the midline; a very feeble indication of a nuchal fold. Scales on the abdomen smooth, imbricate, two to three times as long and three to four times as broad as the enlarged scales of the mid-dorsal line; scales on the throat ovoid; much smaller on the sides of the throat than near the midline; an average scale near the midline of the throat about one-half as large as the abdominals; scales on the extreme anterior portion of the throat, that is directly behind the mentals, about twice as long as wide, about two to three times as long as the more posterior throat scales. No dewlap. Upper surface of the fore limbs covered with imbricate keeled scales; under surface of the forearms with smooth scales of approximately the same size; under surface of the upper arm covered with granules; preaxial surface of the upper leg covered with large scales which are keeled on the upper surface of the limb and smooth on the ventral surface; post-axial surfaces of the upper limb covered with granules; lower leg covered with small keeled scales above and much larger smooth or slightly keeled scales on the ventral surface. Digits of fore limb with relatively smaller enlargements than occur in the hind limb; seventeen lamellae under the fourth finger; thirty-four lamellae under the fourth toe. Tail very slender, approximately two and one-half times as long as the distance from snout to vent; tail only slightly compressed and with a barely differentiated crest; in the center section of the tail the scales on this crest only one-third to one-fourth larger than the scales on the side; about six vertical scale-rows on the side of the tail between one cleavage groove and the next; two enlarged post-anal plates.

Ground tone of the dorsal surface (in alcohol) a slate gray; four broad bars of reddish brown extending across the back between the fore and hind limbs, each bar edged with very dark brown; an oval spot of gray marking each cross-bar at its intersection of the mid-dorsal line; the lower sides of the body dark brown spotted with gray or white; some ill-defined grayish spots on the neck and back of the head, the most conspicuous of these forming a semicircular bar behind the orbit; upper and lower eyelids white; legs and tail brownish gray above and on the sides feebly cross-barred or blotched dark brown and white; ventral surface of the throat and abdomen white suffused with gray on the lower jaw and posterior part of the throat; under surfaces of the appendages white tinged with brown, especially on the posterior limbs.

DIMENSIONS.—Head and body, 46.5 mm.; tail, 113.5 mm.; snout to posterior edge of ear, 15.5 mm.; snout to center of eye, 10.5 mm.; width of head, 8 mm.; fore leg to base of toes, 14 mm.; hind leg to base of third and fourth toe, 29 mm.

VARIATION.—The seventy-five paratypes (A. M. N. H. Nos. 51081–127, 51129–56) show marked sexual dichromatism. Thirty-four are

males, thirty-nine are females, and two are sexually immature. The males are uniformly cross-barred but the females show variations of a longitudinal striping or an approach toward the cross-bars but never the complete broad saddles of the males. In some of the males these cross-bars are not interrupted on the mid-dorsal line as in the type. The females are more uniformly brown in tone and in life do not show the vivid green of the males. In some females the junction of the lighter color of the back and the dark of the sides forms nearly straight dorsolateral lines. In others these dorsolateral lines are wavy and in a few the dark brown extends up from the sides at intervals and very nearly reaches the center of the back, or does so in a few places.

The females do not attain the size of the males, the longest one in the collection measuring 41 mm. from snout to vent, as against 49 mm., the longest male. Moreover, the head is proportionately shorter in the females. Usually the females are distinguished from the males by the absence of the two enlarged scales just posterior to the vent on the under surface of the tail. Some females, such as A. M. N. H. No. 51114, verified by dissection as to sex, may have a pair of large post-anal scales but these are not so well developed as in adult males. In the majority of females, however, these enlarged scales are either entirely lacking or are very small.

In life, the male is an extremely beautiful lizard. In its usual and brightest phase the dorsal surface of the head is an olive-green; the neck a lighter green, spotted with brown. The back is a bluer green while the four broad saddles or cross-bars are a tone of burnt umber. The dorsal surface of the tail, for the anterior two-thirds, is a yellowish green with several dark brown bars. The posterior end of the tail is brown. The side of the head is greenish brown back to the eye. The upper eye-lid may be a vivid golden yellow. The posterior corner of the lower lid may be blue or purplish. Just posterior to the eye is a narrow patch of dark brown, followed by a crescent of light blue or white. Posterior to this the side of the head is a brownish green merging into the lighter green of the side of the body which is peppered and veined with brown. Extending from a point on the upper labials anterior to the eye along the sides of the body nearly to the hind leg is a slightly broken white or cream-colored line edged with brown and suffused in the region over the front leg with yellowish green. The legs are light brown above with slightly darker bars. They are nearly white beneath. The ventral surface of the abdomen is cream-colored, faintly tinted with brown and

green. The throat is the same color with several rows of very faint brown spots along the sides.

This species changes color rapidly and to a marked degree. When the lizard is caught or frightened these colors may almost instantly become darker, the green changing to gray or dark brown with the brown cross-bars growing darker and almost black edged. The head becomes dark brown and the labials greenish. The pineal region becomes white and very conspicuous. The ventral surfaces turn greenish or yellowish and the spots become more distinct.

Throughout the region studied this species was comparatively common in moist situations at altitudes over 1500 feet. The first specimens discovered were on ferns and low bushes along a stream at an altitude of 1800 feet on the coffee finca of Señor Luis E. Del Monte near Barahona. The estate was later collected over up to 3200 feet, and the lizards were found in various places up to that altitude. Near Paradis they were found on the property of Mr. G. Herrmann where collecting was carried on between 1800 and 2400 feet. At Polo they were found in the valley at 2300 feet and in the neighboring mountains as high as 3700 feet. Also at Maniel Viejo at 3000 feet. Palomino Springs, near Barahona, was the lowest place where they were observed, a few being taken along a stream at 1500 feet. It is believed that the lower mountain sides are not humid enough for the species. It was much more terrestrial in its habits than the other species of *Anolis* in the same locality, being found on the ground and on low brush in coffee groves and forested areas. Its favorite habitat, however, was on low plants, leaves and trash along mountain streams and in humid ravines.

The specific name refers to the Sierra de Bahoruco throughout, which range the lizard appears to be abundant.

Leiocephalus altavelensis, new species

DIAGNOSTIC CHARACTERS.—Closely allied to *Leiocephalus barahonensis* Schmidt from which it differs in its conspicuously spotted head; the throat grayish in the female or dark bluish-black in the male, but always with some indication of white spotting in both sexes. No conspicuous spots or stripes on the body, but the female with feeble bars of dark brown across the back and frequently some indication of a pale dorsolateral stripe. Scales behind ear keeled and imbricate, not granular. Three scales on each side between the rostral and supraorbital ring; the posterior separated from the canthus by a wedge-shaped scale. About fifty scales around the middle of the body; hind leg reaching between the ear and eye.

DETAILED DESCRIPTION.—Type: A. M. N. H. No. 51055, adult male. Collected on Alta Vela Island, D. R., October 9–10, 1932, by W. G. Hassler.

Anterior head-shields smooth, posterior ridged; three enlarged scales, a supranasal, a prefrontal and a frontal on each side of the snout between rostral plate and supraorbital ring; the posterior of these three scales more than twice as large as either of the anterior; these three scales on each side separated from the homologous row on the opposite side by a median row of three scales; the supranasals narrowly in contact anteriorly; nasals and supranasals in broad contact with rostral; frontal separated from the canthus by an elongate wedge-shaped scale; two or three scales between this elongate scale and the nasal; two heavy rounded canthus scales followed by four long and very narrow superciliaries, the first three of which greatly overlap; a single small scale between the anterior canthus and the nasal; six enlarged supraoculars separated from the superciliaries by a single row of small scales except anteriorly where one or two extra scales are intercalated; three pairs of enlarged scales between the supraorbital rings, the anterior pair much larger than the others; occipital small and separated from the two posterior pairs of these enlarged interorbital scales by a row of three small scales; a pair of elongate parietals on either side, the median pair making broad contact behind the occipital; four or five scales, half the size of the occipital, or less, between the lateral pair of parietals and the small temporal scales. Four upper labials and four and a half lower labials to a point below the center of the eye; temporal scales increasing gradually in size, the last one, just above and in front of the ear, the largest and most conspicuous; anterior border of the ear opening with three or four coarse projecting scales. Dorsal scales, large, imbricate, mucronate; the laterals about two-thirds as large as the dorsals, becoming smoother and more rounded toward the lower portions of the sides; ventrals approximately as large as the dorsals, smooth, their posterior edges slightly denticulate; about fifty scales around the middle of the body; about fifty-eight scales from the occiput to a point directly above the vent, sixteen dorsal scales the equivalent of the distance from snout to occiput; nuchal scales small, those on the sides of the neck like the dorsals, those behind the ear keeled and imbricate, not granular. Shoulder folds present; no lateral folds. The adpressed hind limb reaches halfway between the ear and the eye. Digits compressed; the fourth toe with 26 tricarinate lamellae. A feeble crest along the back and tail base; tail compressed; scales on the under surface of the tail about as large as the dorsals; postanal scales slightly enlarged.

Dorsal surface of the head and body (in alcohol) cinnamon-brown faintly tinged with metallic green and spotted with yellow or gray; the spots on the dorsal surface of the head nearly as large as the scales, while those on the back are much smaller and those on the posterior surfaces barely distinct; sides of the head, neck and body as well as the whole throat a blue-gray; sides of the head, throat and chest spotted with white; sides of the body with several vertical rows of pale blue spots; the spots tend to run together on the side of the head where they form two vertical bars across the jaws and eyelids and on the chest where they form a broken cross-bar. Under surface of the legs and middle of the abdomen straw-color.

DIMENSIONS.—Snout to vent, 60 mm.; head to posterior edge of ear, 15.5 mm.; tail (regenerated), 38 mm.; fore leg, 24 mm.; hind leg, 44 mm.; width of head, 11.5 mm.

VARIATION.—The twenty-two paratypes (A. M. N. H. Nos. 51051–4, 51056–73) show little variation. The feeble spotting of the dorsal surface of the body is often inconspicuous but the head is always distinctly spotted both above and below. In the female a series of transverse bars

or widely opened V's of dark brown are frequently found on the back; the throat is always much paler gray than the male's but the white spots may be more numerous and smaller. The tail of the type is regenerated and does not show the crest which in the unregenerated tail is better developed than along the middle of the back.

In life, the yellowish-brown dorsal color was overlaid with a golden-bronze sheen. The head was slightly darker, almost every scale being edged with dark brown while the sides of the head were darker still. Usually there was no distinct pattern on the back. One adult male, just before shedding, showed faint cross-lines on the back but these were less distinct after shedding. The dorsal surface of the legs was darker than that of the body and showed light spots but no bars. The tail was light yellowish-brown, lighter than the body and with extremely faint, narrow cross-lines. The side of the body was a greenish hue with scattered spots of a bright metallic green covering individual scales. The throat was a bronzy, dark brownish black with small white spots, often running together. Toward the chin the throat became less bronzy. The belly was yellowish with sometimes a slightly green tint. In young specimens the tail was more orange. No marked sexual dichromatism was noticed in the field.

HABITAT.—This species was common on the island of Alta Vela, living among the rocks, leaves and grass along the coast and ranging to the top of the higher ridge in the center of the island.

Mabuya lineolata, new species

DIAGNOSTIC CHARACTERS.—A slim, short-legged species having ten stripes of dark brown extending the length of the body; supranasals in contact behind the rostral; two pairs of nuchals; when the limbs are pressed along the side of the body, the appendages fail to meet by a distance greater than or equal to the length of the hind limbs.

DETAILED DESCRIPTION.—Type: A. M. N. H. No. 42145, female. Collected at Monte Cristy, D. R., January 8, 1930, by W. G. Hassler.

Snout short; a small postnasal present; anterior loreal making a narrow contact with the first labial; supranasal in contact behind the rostral; frontonasal broader than long, making contact with the anterior angle of the frontal; prefrontals barely separated by the frontonasal; frontal about one-fifth longer than the frontoparietals; about the same length as a parietal, in contact with the second supraocular only; four supraoculars, second one-half again as large as any of the others; four superciliaries, second as long as the third and fourth combined; a pair of frontoparietals, about the same length as an interparietal; parietals in contact behind the latter; one pair of nuchals; four supralabials anterior to the suboculars; one or two suboculars followed by a supralabial which is larger than the anterior supralabials and slightly higher than the suboculars. Ear opening ovoid, a trifle smaller

than the diameter of the transparent plate in the lower eyelid, its greatest diameter about equal to length of the scales covering the side of the body. Dorsal scales smooth; 26 scales around the middle of the body, laterals a little smaller than the others. When the legs are pressed against the body the hind leg fails to meet the anterior leg by a distance greater than the total length of the hind limb; subdigital lamellae smooth; tail regenerated, nevertheless slightly longer than the head and body length.

Dorsal surface of the head, body and tail (in alcohol) striped, a ground tone of gray divided on the dorsal surface by ten conspicuous stripes of dark brown, the two most ventral stripes on each side, about half the width of the two stripes immediately dorsal to them on either side; the latter extending from the region of the eyes the whole length of the body and well on to the tail; the dark stripes not co-equal in width to a scale but extending through the middle or the lateral portion of each scale. Ventral surface a uniform grayish tint except on the tail where the two most ventral stripes on the side of the body have converged to form two barely defined stripes on either side of the midline of the tail.

DIMENSIONS.—Snout to vent, 59 mm.; axilla to tip of longest finger, 10.5 mm.; groin to tip of longest toe, 15 mm.; tip of snout to ear opening, 8.5 mm.; greatest breadth of head, 6 mm.

VARIATION.—Of the two paratypes, an adult male (A. M. N. H. No. 51766), measuring 56 mm. from snout to vent, is almost identical to the type, having the same distinctive color pattern and short legs. When its hind leg is pressed forward and its fore leg backward, the distance between the appendages is approximately equal to the length of the hind leg. The head-scales are essentially like those of the type, but there is only one elongated subocular on each side. The other, a young specimen (A. M. N. H. No. 51765), 27 mm. from snout to vent, differs from the two adults in the series by having a stripe on either side of the body in addition to the ten stripes of dark brown found in the adults. There is also some indication of five other longitudinal stripes of brown along the ventral surface of the belly.

In life the dark stripes were nearly black while the light ones were lemon-yellow, changing into bluish at the tail-base. The tail was blue and the whole color pattern greatly resembled that of *Ameiva lineolata* Duméril and Bibron.

HABITAT.—The species is known only from the region of Monte Cristy, Dominican Republic. The type was secured by a native who said he found it under rubbish near the bank of the Rio Yaque del Norte, not far from Monte Cristy. The other two specimens were brought in by natives from the same region. They were mistaken from *Ameiva lineolata* due to the remarkable resemblance in size and color. Despite the fact that over 300 of the *Ameiva* were brought in and the junior writer made a special search for them, no other specimens of *Mabuya* were secured.